MEDIA BUREAU SEEKS COMMENT
ON EXPERIMENTAL ECONOMICS STUDY EXAMINING
HORIZONTAL CONCENTRATION IN THE CABLE INDUSTRY
CS DOCKET NOS. 98-82, 96-85

MM DOCKET NOS. 92-264, 94-150, 92-51, 87-154
DA 02-733
MB DOCKET NO. 02-70

PLEADING CYCLE ESTABLISHED

COMMENTS: July 18, 2002   **REPLY COMMENTS: August 2, 2002**

The Federal Communications Commission recently commissioned a study regarding the extent to which different levels of horizontal concentration among multichannel video program distributors ("MVPDs") might affect the flow of video programming to consumers. **The** study utilized the methodology of experimental economics, which examines economic interactions among market participants in controlled laboratory settings. The study simulated a market environment in which buyers, implicitly representing cable and direct broadcast satellite distributors of multi-channel video programming, and sellers, 'implicitly representing programming networks, purchased and sold goods, representing programming, negotiated trades, implicitly representing affiliate fees that grant **MVPDs** the right to distribute the sellers' programming.

The Media Bureau is seeking comment on the study report, attached hereto, which is being released concurrently by the Office of **Plans** and Policy as OPP Working Paper No. **35**, "Horizontal Concentration in the Cable Television Industry: *An* Experimental Analysis" by Mark Bykowsky, Anthony M. Kwasnica and William Sharkey ("Working Paper").'

Specifically. interested parties are asked to comment on the value of the study in providing empirical evidence relevant to the ownership issues raised in the Commission's pending cable ownership rulemaking proceeding' and the AT&T/Comcast license transfer proceeding.' Interested parties also are asked to address

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[1] The spreadsheets with the parameter values that were used in each experimental session, and all of the data collected during the experiments that were used in preparing the Working Paper also are being released.

[2] *See Implementation of Section 11 of the Cable Television Consumer Protection and Competition Act of 1992, Implementation of Cable Act Reform Provisions of the Telecommunications An of 1996, Commission's Cable Horizontal and Vertical Limits and Attribution Rules. Review of the Commission i Regulations Governing Attribution of Broadcast and Cable/MDS Interests, Review of the Commission's Regulations and Policies Affecting Investment in the Broadcast Industry. Reexamination of the Commission's Cross-Interest folic),* **Further** Notice of Proposed Rulemaking, FCC 01-

the study's conceptualization, underlying assumptions, design, and methodology. Finally, interested parties are encouraged to examine the released data and draw their own conclusions. to explore additional avenues of research, and to consider further studies or analyses and submit their findings to the Commission in the interest of developing a complete evidentiary record and molving the complicated issues posed by adoption of general ownmhip standards and grant of specific ownership approvals.

Interested parties may file comments on the Working Paper on or before July **18, 2002,** and may file reply comments on or before August **2, 2002.** Comments may be filed using the Commission's Electronic Filing System (ECFS), at **<http://www.fcc.gov/e-file/ecfs.html>,** or by filing paper copies. All filings must reference **CS** Docket Nos. *98-82. 96-85,* **M M** Docket Nos. 92-264, 94-150, 92-51, 87-154, and **MB** Docket **No. 02-70.**

Interested parties filing paper copies must send an original and sixteen copies, and reference the above designated dockets. Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight **U.S. Postal** Service mail (although we continue to experience delays in receiving **U.S.** Postal Service mail). The Commission's contractor, Vistronix, Inc., will receive handdelivered or messmger-delivmd paper filings for the Commission's Secretary at **236** Massachusetts Avenue, **NE,** Suite 110, Washington, DC **20002.** The filing hours at this location are **8:00** a.m. to **7:00** p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than **U.S. Postal** Service Express Mail and Priority Mail) must be **sent to 9300** East Hampton Drive, Capitol Heights, MD **20743. U.S.** Postal Service first-class mail, Express Mail. and Priority Mail should be addressed to **445 12**th Street, SW, Washington, DC **20554.** All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission. Interested parties **also** must send either one electronic copy via e-mail or a paper copy of each filing to Qualex International. Portals **II, 445 12* Street,** SW, Room **CY-B402,** Washington, DC **20554,** telephone **(202) 863-2893,** facsimile **(202) 863-2898,** or email at qualexint@aol.com; ten **(10)** paper copies of their filing to Linda Senecal. Industry Analysis Division, Media Bureau, Federal Communications Commission, **445 12**th Street, **SW, Room** 2-C438, Washington, **DC 20554;** and one electronic copy via e-mail to lsenecal@fcc.gov.

Interested parties using the ECFS must file seven copies of electronic submissions (one for each docket referenced in the caption). In completing the transmittal screen, they should include their full name, postal service mailing address, and the applicable dockets. To get filing instructions for e-mail comments, commentm should **send** an e-mail to ecfs@fcc.gov, including "get form your e-mail address" in the body of the message. A sample form and directions will be sent in reply.

Both the rulemaking and the transfer proceedings are "permit-but-disclose" for purposes of the Commission's *ex parte* **rules.**[4] *Ex parte* communications will be governed by section **1.206(b)** of the Commission's rules.[5] We urge interested parties submitting written *ex parte* presentations or summaries of oral

263, **CS** Docket Nos. 98-82, 96-85, MM Docket Nos. 92-264, 94-150, 92-51, 87-154, 16 **FCC Rcd 17312 (2001)** *("Further Notice").* The *Further Notice* also examines attribution rules applicable to cable operators and broadcasters.

[1] **See Applications for Consent to** *the Transfer of Control of Licenses, Comcast Corporation nnd AT&T Corp., Transferors, fo AT&T Comcast Corpororion. Transferee,* **Public Notice. DA 02-733, MB Docket No. 02-70 (rel. March 29, 2002).**

[4] *See generally* 47 C.F.R. ~$1.1200-1.1216.

[5] **47 C.F.R. § 1.1206(b).**

cable ownership **proceeding**[6] and its March **29.2002** Public Notice in the AT&T/Comcast license transfer **proceeding.**[7]

Copies of the **Working** Paper and **other** materials being **released** by **this** Public Notice may be obtained from Qualex International, Portals **II, 445** 12th **Street, SW. Room CY-B402,** Washington, **DC 20554, and** will **also** be available **through** ECFS. **These** documents **are also** available for public inspection and copying during normal reference room hours **at** the Commission's Reference Information Center, **445 12* Street, SW,** CY-A257, Washington, DC **20554.** The documents will be **posted on the Media** Bureau's website at <http://www.fcc.gov/mb>, and **on** the Office of Plans and Policy's website at <http://www.fcc.gov/opp/workingp.html>.

Alternate formats of **this** public notice (computer diskette, large print, audio recording, and Braille) are available to persons with disabilities by contacting Brian Millin at **(202) 418-7426** voice, **(202) 418-7365** *TTY,* or email at bmillin@fcc.gov.

The media contacts for **this** Public Notice arc Michelle **Russo, (202) 418-2358.** and **Margo** Domon Davenport, **(202) 418-2949.** The Media Bureau contact is Royce Sherlock, **(202) 418-2330.** The Office **of** Plans and Policy contact **is** Mark Bykowsky, **(202) 418-1695.**

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[6] *See Further Notice,* 16FCC Rcd at **17371 ¶ 132.**

[7] **See** Public Notice, *AT&T Cop.* and *Comcast Cop. Seek FCC Consent for a Proposed Transfer of Control,* **MB** Docket No. **02-70, DA** 02-733 (rel. March 29, 2001), as *modified* by Public Notice, *Erratum* and *Order Extending Filing* · *Deadline,* **MB Docket No. 02-70, DA 02-70** (rel. May 3,2002).

OPP Working Paper Series

35 Horizontal Concentration in the Cable Television Industry: An Experimental Analysis

June 2002

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Horizontal Concentration in the Cable Television Industry:
An Experimental Analysis

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OPP Working Paper No. 35

Table of Contents

Executive **Summary**

The Federal Communications Commission ("FCC') recently initiated a rulemaking proceeding to examine, among other things, the subscriber (horizontal ownership) limits that apply to cable operators.' This study employs economic theory and experimental economics to shed light on the effect of changes in horizontal concentration among cable operators on the flow of programming to consumers.' The study was designed to complement the information and analyses provided in the comments filed in the FCC's rulemaking proceeding.

Experimental economics involves the study of the interactions among market participants in a controlled laboratory setting. Conducting an economic experiment requires a set of agents (e.g., buyers, sellers), an environment in which they must make individual decisions (e.g., complete a trade), and a method of assessing the results of the decisions made by these economic agents. The experimental study began with the creation of a "market" that parallels the market in which buyers (i.e., Multichannel Video Programming Distributors ("MVPDs") and sellers (i.e., programming networks) negotiate affiliate fees.' To this end, buyers were assigned valuations for the programming networks and a set of costs. Valuations reflected the additional subscriber and local advertising revenue buyers would earn from carrying the programming networks. Sellers were assigned a set of costs and a schedule that shows the revenue they would receive if they conducted a trade with a particular buyer. This financial payment

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[1] *Implementation of Section 11 ofthe Cable Television ofthe Cable Television Consumer Protection and Competition Act of 1992, Implementation of Cable Act Reform Provisions ofthe Telecommunications Acl of 1996, The Commission's Cable Horizontal and Vertical Ownership Limits and Attribution Rules, Review of the Commission's Regulations Governing Attribution ɖ Broadcasr and Cable/MDS Interests, Review of the Commission's Regulations and Policies Affecting Investment in the Broadcast Industry, Reexamination of the Commission's Cross-Interest Policy, CS* Docket Nos. 98-82, 96-85, MM Docket Nos. **92-264, 94-150, 92-51, 87-154,** Further Notice of Proposed Rulemaking, **16** FCC Rcd **17312 (2001)** (*"Further Notice"*).

[2] Congress directed the Commission to take into account, "among other public interest objectives," seven public interest factors. **47** U.S.C. §§ 533(2)(A)-(G). One ofthe factors specifically directs the Commission to "ensure that no cable operator or group of cable operators can unfairly impede, either because ofthe size of any individual operator or because ofjoint actions by a group of operators of sufficient size, the flow of programming from the video programmer to the consumer." **47 U.S.C**§ 533(2)(A). In testing the effects of concentration in the cable television industry. this study has addressed and focused upon Factor **A.**

[3] The term "affiliate fee" refers to the payment made by an MVPD (e.g., cable operator or a direct broadcast satellite service provider ("DBS")) to a programming network in exchange for the right to carry the programming assembled by the network. For purposes of this study the term "programming network" is synonymous with the term "cable network."

represented the revenue the programming network would earn from selling national advertising time if a given MVPD carried it.[4]

In the naturally occurring market, buyers and sellers conduct trades through a sequential, multi-lateral bargaining process. Using a set of networked computers and computer software, buyers and sellers were given the opportunity to employ this process to negotiate mutually acceptable affiliate fees. Negotiations consisted of buyers submitting one or more bids to buy to sellers, and sellers submitting one or more offers to sell to buyers. **A** buyer's bid represented the maximum amount the buyer would pay a seller for the right to carry a programming network. **A** seller's offer represented the minimum amount for which the seller would grant the buyer the right to carry its programming network. The bids to buy and offers to sell were only disclosed to the parties to which they were directed. Participants were permitted to negotiate simultaneously with multiple parties and were permitted to conduct a trade at any time within a given trading period.

As in the actual marketplace, buyers and sellers earned revenue and generated profits based upon the decisions they made. Buyers earned revenue by negotiating affiliate fees that were less than their assigned willingness to pay for the programming networks. Sellers earned revenue by inducing buyers to pay them for the right to carry their network.[5] Sellers' affiliate revenue was augmented by a payment that represented the national advertising revenue they earn from completing trades with buyers. Buyers and sellers earned profits if the total revenue they earned from their trades exceeded their costs.

Experiments were conducted in a variety of horizontal concentration environments. In one environment the market consisted of two major cable operators (i.e., market shares of **44%** and 39%) and one DBS operator. In another environment the market consisted of a single "large" cable operator (i.e., market share 51%) and several substantially smaller buyers. In yet another environment, the market consisted of two "moderately-sized" cable operators (i.e., market shares of **27%** and **24%**) and several

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[4] In the naturally occurring market, in addition to affiliate fees, cable operators and programming networks negotiate over the number of "avails" which are assigned to the cable operator. In the current analysis parties only negotiate affiliate fees.

smaller buyers. These market environments were selected in order to test whether the relative and absolute size of a buyer, as measured by the number of MVPD customers served, has an impact on the affiliate fees negotiated by buyers and **sellers.** The largest buyer in each of these market environments served between 27% and 51% of the MVPD market.

An attempt was made to include in the experimental market those features of the actual market that have an important impact on the affiliate agreements negotiated between programming networks and MVPDs. However, the experimental market did not and could not display all the complex characteristics of the actual market. For example, the experimental market included far fewer programming networks and MVPDs than there are in the actual market.[6] The experimental market also did not take into account the possibility that some large cable operators have attributable interests in programming networks. In addition, the experimental market did not include advertisers as experimental subjects, nor did it take into account that a programming network's bargaining power in an upcoming affiliate agreement negotiation may be enhanced if it is currently carried by an MVPD. These and other abstractions from features of the actual marketplace, and the relevance of some of these abstractions to the study's results. are discussed in more detail in Section 5.0, below. The absence of some of these characteristics may have affected the results of the study.

The major results of the experimental study are as follows.' First, when the number of programming networks exceeds the cable operator's channel capacity, higher levels of horizontal concentration (holding the number of buyers constant) led to a modest reduction in "economic efficiency." Economic efficiency measures the extent to which society makes the best use of its scarce resources.[8] In the current context, a

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[5] One possible outcome of the negotiation process involves a seller paying a buyer for the right to acquire access to the buyer's attracted MVPD subscribers.

[6] The experimental market included four programming networks and, depending on the experiment, either three or five MVPDs.

[7] The results that immediately follow assume that a large buyer does not have the ability to impose a "Most Favored Nations" provision on **sellers.** *An* "MFN guarantees that a large cable operator pays an affiliate fee, expressed on a per subscriber basis, that is no higher than the affiliate fee paid by a smaller cable operator. Results that apply to an environment where an MFN provision is imposed upon sellas by large buyers are discussed later in the Executive Summary.

[8] Trades buyers and sellers differed in the amount of surplus they generated. In the presence of limited channel capacity, societies' resources are best used when only those trades that generate the most surplus

reduction in economic efficiency indicates that fewer or socially **less** desirable trades occurred in the more concentrated market structure than in the less concentrated market structure. By sending the wrong price signals regarding the value society places on particular types of programming offered by programming networks, a reduction in market efficiency could affect both the type and quality of television programming received by viewers. The reduction in market efficiency also indicates that there could be a decline in the benefit society receives from the resources used in creating advertisements.

Second, the experimental results indicate that in the experimental economics setting the bargaining power of a cable operator that serves **27%** of the MVPD market does not differ substantially from the bargaining power of a cable operator that serves 51% of the MVPD market. **A** buyer's bargaining power was measured as the percentage of total surplus (i.e., gains from trade) captured by a buyer when completing a trade with a seller. From the perspective of a programming network, a cable operator that serves 27% of the MVPD market is as powerful as one that serves 51% of the market.

Thud, the experimental results indicate that there is a statistically significant decrease in the DBS operator's bargaining power when two cable operators serve **44%** and **39%** of the MVPD market, than when the largest cable operator serves 27% of the MVPD market. **A** reduction in its bargaining power means that the DBS operator can expect to pay higher affiliate fees following the increase in horizontal concentration.' The increase in affiliate fees paid by the DBS operator could result in an increase in the subscription fee paid by DBS customers.

Fourth, the results indicate that sellers representing the least popular programming networks had difficulty earning a profit (i.e., conducting a series of trades that allowed them to more than cover their costs) in each of the horizontal concentration environments considered. The results indicate that the more popular programming networks were much more likely to earn a profit in each of the horizontal concentration environments.

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are consummated. There is nothing in the bargaining process involving cable programmers and MVPDs that ensures that only those trades that generate the most surplus are consummated.

[9] The analysis assumed that the MVPD market is served by a single DBS service provider whose market share is approximately equal to the sum of the shares possessed by Echostar and DirectTV. This assumption was made for analytical purposes and does not indicate or suggest that the FCC has made a decision regarding whether to permit a merger between these two entities.

These results are consistent with the result that shows that a seller's bargaining power is directly related to its popularity.

Additional experiments were conducted to explore the effects of two institutional features of the market environment. One set of experiments relaxed the assumption that buyers have limited channel capacity. In these experiments buyers were allowed to trade with every seller. The results of these experiments differed markedly from experiments where buyers had limited channel capacity. Where a channel capacity constraint did not exist, all sellers were consistently able to conduct a set of trades that enabled them to earn a profit. Consistent with this outcome, sellers' bargaining power increased while buyers' bargaining power declined. Thus, it appears that the bargaining process between MVPDs and programming networks fundamentally changes when the number of programming networks exceeds the MVPD's channel capacity. The resulting increase in the MVPD's bargaining power is due to the desire of programming networks to be carried by as many MVPDs as possible and their willingness to compete for the right to be carried by a given MVPD.[10]

Additional experiments were also conducted to explore the effect of a large cable operator's ability to successfully include a "Most Favored Nation" ("MF"') provision in an affiliate agreement. Under an MFN, a common feature of today's market negotiations involving a large buyer, the programming network guarantees that the large buyer will not pay an affiliate fee that is higher than the affiliate fee (expressed on a per subscriber basis) paid by any smaller buyer. The results of these experiments differed markedly in many respects from experiments where large buyers did not impose an MFN provision on programming networks." For example, the experimental **results** indicate that the existence of an MFN provision substantially increases the bargaining power possessed by buyers. Furthermore, when negotiating with a popular programming network, large cable operators are able to negotiate lower affiliate fees (per subscriber) than small buyers (i.e., cable operators and DBS providers). A programming network's ability to negotiate a high affiliate fee with a large buyer depends on the popularity of the programming network. The more popular the programming network, the higher the affiliate fee. These

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[10] *An* increase in cable operators' bargaining power translates into a reduction in their affiliate fees.
[11] Under the MFN treatment, the rules of the experiment required that sellers provide the largest buyer the lowest affiliate fee (per subscriber).

results indicate that both buyers and sellers have an incentive, based solely on the expected changes in negotiated affiliate fees, to grow larger.

In addition to the effect that a buyer's size may have on the negotiated affiliate fee, the degree of concentration among cable operators appears to affect the affiliate fees negotiated by buyers and **sellers.** For example, buyers appear to be able to negotiate lower affiliate fees in a market that includes two major cable operators (i.e., market shares of **44%** and 39%) and one DBS operator than in a market that includes a single large cable operator (i.e., market share 51%) and several substantially smaller buyers.

The popularity of the programming network was also found to influence its ability to earn a profit in the different market concentrations examined in this study. According to the experimental data, the least popular programming networks incur losses in every market concentration examined. Among the market concentrations examined, the least popular programming networks incur the greatest losses in a market that includes a single large cable operator (i.e., market share **51%)** and several substantially smaller buyers. The least popular cable networks appear to incur the smallest losses in a market that includes two major cable operators (i.e., market shares of **44%** and 39%) and one DBS operator. Among the market concentrations examined, a moderately popular programming network only obtains a profit in the market that exhibits the least amount of horizontal concentration. Such a market includes two moderately-sized cable operators (i.e., market shares of 27% and **24%)** and several smaller buyers. Very popular programming networks appear to be immune, over the range of horizontal concentrations considered in this study, to an increase in horizontal concentration. According to the experimental data. there is no substantial difference in the profits earned by the most popular programming networks across the range of horizontal concentrations considered.

In parallel with our experimental analysis, we reviewed existing economic theories that might provide insights into the effect of horizontal concentration on the level of the affiliate fees negotiated by buyers and **sellers.** Particular attention was paid to several solution concepts found in cooperative game theory. Consistent with the experimental results, cooperative game solutions uniformly show higher payoffs to the buyers (i.e., lower affiliate fees paid to programming networks) when there is a channel

capacity constraint versus when no such constraint exists. This and other results are discussed in Appendix A.

1. Introduction

This paper employs economic theory and experimental economics to shed light on the effect of changes in horizontal concentration among cable operators on the flow of programming to consumers. For purposes of the study, the flow of programming to viewers is impeded if a level of horizontal concentration adversely affects the profits earned by programming networks." To this end, the study examines the relationship between different levels of horizontal concentration and the level of the affiliate fees buyers (i.e., cable operators and a DBS service provider) pay programming networks.[13] The paper also evaluates the effect of changes in horizontal concentration on economic efficiency. In the current context, economic efficiency measures the extent to which the gains of trade enjoyed by buyers and sellers are maximized. By sending the wrong price signals regarding the value society places on particular types of programming offered by programming networks, a reduction in market efficiency could, by reducing the rents obtained by programming networks, affect both the type and quality of programming received by television viewers.

The study incorporates numerous market features that may be relevant in considering the effects of horizontal concentration on the flow of programming to viewers.[14] First, affiliate agreements are negotiated in a sequential, multi-lateral bargaining environment where programming networks offer to license their assembled programming packages to a collection of MVPDs.[15] MVPDs, in turn, bid for the right to carry these packages of programs. Each side incurs costs that must be covered by earned

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[12] It is natural to emphasize existing programming networks since there is an existing flow of programming to viewers. In addition, there are publicly available cost and other data for existing programming networks.

[13] The cable network also generates revenue through the sale of national advertising. Using publicly available data, the analysis will make some assumptions regarding the size of such revenue. These assumptions will remain constant throughout the analysis in order to isolate the affect of horizontal concentration on the flow of programming to viewers.

[14] An "affiliate agreement" specifies the terms and conditions under which cable operators have the authority to carry a cable network. The term "carriage agreement" is sometimes used to describe such an agreement.

[15] The term "sequential" refers to the fact that trader are not all completed at the same time. The term "multi-lateral" means that buyers and sellers typically conduct trades with multiple counterparties.

revenues. Because the outcome of the bargaining process is not known in advance, all parties face financial uncertainty. One important research question involves examining whether the level of horizontal concentration among cable operators affects the ability of programming networks to complete a series of affiliate agreements that, taken together. enable them to recover their costs?

Second. MVPDs have the ability to choose both the type and number of cable networks to carry.[16] Does their ability to exercise such discretion affect the level of the affiliate fees MVPDs pay to programming networks?"

Third, programming networks vary in popularity. programming costs, and the amount of national advertising revenue they earn, and thus may be affected to different degrees by given levels of horizontal concentration among cable operators. Which programming networks will likely be affected most by increased levels of cable concentration?

Fourth programming networks negotiate affiliate agreements with both cable operators and DBS service providers. Does an increase in horizontal concentration among cable operators affect the affiliate fees paid by DBS service providers?

Fifth, some affiliate agreements may contain provisions that may affect the affiliate fees paid by MVPDs. For instance, an affiliate agreement between a large cable operator and a programming network may include an MFN clause. Do MFN provisions affect the level of the affiliate fees programming networks obtain from MVPDs?

This paper addresses these important questions in considering the implications of horizontal concentration in the W P D industry. The paper is organized as follows: Section 2 discusses, in greater detail, the methodology of experimental economics and how the study was designed to examine the possible effects of horizontal concentration in

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[16] *See* **47 U.S.C.**§ 544(b)(prohibiting local authorities from "establish[ing] requirements for video programming and other information services."); *see also Turner Broadcasting System, Inc. v. Federal Communications Commission, 5* 12 US. 622, 636 (1994) (subjecting cable operators' "must carry" requirements to intermediate scrutiny, in recognition of their First Amendment rights generally and editorial discretion in selecting programming particularly); *Time Warner Entertainment* Co. *v. FCC,* **240** F.3d 1126, 1129 (D.C. Cir. 2001) (remanding cable operators' horizontal and vertical ownership limits under the intermediate scrutiny standard, in recognition of the restraint such limits place on their ability to "reach the number of viewers to whom they can speak" and to "exercise their editorial control over a portion of the content they transmit," respectively.)

[17] For an analysis of some of the economic effects of cable operators' selection of programming networks, *see* Stanley Besen and Leland Johnson, "An Economic Analysis of Mandatory Leased Channel Access for Cable Television, Rand Corporation Report R-2989-MF (1982).

the cable television industry. Section **3** presents the experimental design employed. including the set of market parameters used in the experimental design. Section **4** presents the results of the economic experiments. Appendix **A** analyzes the issue of horizontal concentration using principles from cooperative game theory. These principles are used to generate a set of predictions regarding the outcome of bargaining between buyers and **sellers.**

2. **Methodology - Experimental** Economics

Policymakers are sometimes asked to answer "what it" questions. For example. they may be asked to determine the effect of employing "circuit breakers" in equity markets or to determine the effect of a requirement that a carrier must file a rate change with a regulator before the rate change can become effective.[18] In many cases, the full consequences of a policy or **rule** may be unknown. As experimental economics involves the study of the economic interactions among market participants in a controlled laboratory setting, it offers policymakers a method by which to analyze potential effects of proposed regulations.

The experimental analysis began with the creation of an experimental market that parallels the market under investigation. In the current context, this market includes a set of human subjects that played the role of buyers and sellers. **Sellers** in our experimental market represented programming networks, and the buyers in our experimental market represented cable operators and a **DBS** provider. The trades that took place in this market were intended to represent the affiliate fees MVPDs agree to pay programming networks for the right to cany their programs." The experimental analysis also required assigning sellers characteristics. Table 1 lists a set of characteristics that broadly define the four sellers (i.e., programming networks) included

[18] See, R. King, V. Smith, A. Williams, and M. van Boening, " The Robustness of Bubbles and Crashes in Experimental Stock Markets," in *Nonlinear Dynamics and Evolutionary Economics.* **(1993) edited by R. Day and P. Chen, Oxford University Press, pp. 183-200 and J. Hong and C. Plott, "Rate Filing Policies For Inland Water Transportation: *An* Experimental Approach."** *Bell Journal of Economics,* **vol. 13 (Spring 1982). pp. I – 19.**
[19] **The economic experiments allow sellers the opportunity to pay buyers for their carriage of their assembled programs.**

in the experiments.[20]   The sellers' costs include monthly operating and programming expenses.

Programming Network	Monthly Costs and :	CPM Prices ($) (30-second spots)	National Avails (Monthly)	Total Day Audience Ratings (%)
#1	1.5	1.00	11,004	.10
#2	1.7	1.00	11,004	.12
#3	10.4	2.34	9,092	.90
#4	39.1	6.99	11,782	1.50

Table 1: Seller Characteristics

Table 2 presents the average buyer's willingness to pay for the right to carry a given programming network.[21]

Programming Network	Willingness to Pay ($ Subscriber Month)
#1	.090
#2	.094
#3	.393
#4	.647

Table 2: Average Buyer's Willingness to Pay

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[20] Data are derived, in part, from a sample of cable networks listed in Paul Kagan ("Economics of Basic Cable Networks 2002," Kagan World Media, September 2001).   The sample of cable networks for programming network #4 consisted of A&E, CNN, Discovery Channel, Lifetime, MTV, and Nickelodeon. The sample of cable networks for programming network #3 consisted of the Cartoon Network, Court TV. and the Family Channel. The sample of cable networks for programming networks #1 and #2 consisted of the Great America Channel, BBC, Health Channel, Ovation, Outdoor Channel, and the Recovery Channel. In some instances, Paul Kagan did not provide estimates for certain data. In these instances an estimate of the missing data was generated.

[21] A buyer's willingness to pay for a given programming network is based upon an estimate of the additional subscriber and local advertising revenue it would obtain from carrying the programming network. An estimate of the local advertising revenue was based on estimates of the programming network's local audience ratings, CPM prices, and the number of local avails.

Buyers were also assigned a set of costs that they had to cover in order to stay in business. Table 3 presents the total monthly costs that were assigned to cable operators and the DBS operator.[22] The analysis assumed that a vast majority of the buyer's costs were already covered by an existing flow of revenue. Thus. the costs listed in Table 3 represent the costs the buyer must cover through its trades with the sellers included in the experiments. These costs include sales/administrative and interest expenses, but excluded programming expenses.[23]

Buyers	Monthly Costs (mil.)
Cable Operators	20.1
DBS Operator	3.4

Table **3: Buyer Monthly** Expenses

In our experimental market, buyers and sellers were allowed to complete a series of trades with each other. Participants in the experimental market faced incentives similar to those that participants in the naturally occurring market face. We established such incentives for sellers by allowing them to retain the money they obtain from any trade. This money included the fee that buyers paid sellers for the right to carry their network and the revenue the seller would earn from selling national advertising time. The level of advertising revenue varied across sellers in the experiments in order to mirror the variation in national advertising revenue earned by different programming networks in practice." The amount of national advertising revenue earned by a seller varied directly with the number of subscribers served by the buyer. The larger the buyer, the greater the national advertising revenue earned by the seller.

We established incentives for buyers by guaranteeing them a sum of money for each trade they conducted. The guarantee can be viewed as a secondary market in which

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[22] These data are based upon information obtained from 10K reports for Adelphia, Classic, Comcast, Cox, insight. and Mediacom and from Paul Kagan, "The State of DBS 2001."

[23] The analysis assumed that the revenue generated from the services provided by the cable operator already covered the buyer's existing programming expenses.

[24] The financial payment the seller received from conducting a trade with a specific cable operator was calculated using the data shown in Table I.

only buyers can participate." The guaranteed money defines the maximum amount the buyer was willing to pay for the right to carry a particular network. Buyers earned money by acquiring the right to carry a programming network for a price that is **less** than the sum of money the buyers are guaranteed. The maximum amount the average buyer is willing to pay for each programming network is shown in Table **2.**

In the naturally occurring market, MVPDs and programming networks conduct trades through a sequential, multi-lateral bargaining process. This market environment was simulated, in part, through the **use** of a data network, a collection of computer terminals. and computer software. In this experimental market, buyers and **sellers** were able to place bids to buy and offers to **sell** to each other, respectively.[26] **A** buyer's bid represented the maximum amount the buyer was willing to pay a seller for **its** set of programs. **A** seller's offer represented the minimum amount the **seller** was willing to receive in exchange for the buyer's right to carry its programs. Buyers and **sellers** "negotiated" with each other by sending each other bids to buy or offers to sell, respectively.[27] Buyers and sellers were **free** to select the entities with whom they negotiated, the manner in which they negotiated (e.g., does a buyer respond to a **seller's** ask by placing a bid?), and the order in which they negotiated with entities on the opposite side of the market?' Importantly, all revised bids and asks had to satisfy a "bid/ask" improvement rule. Under that **rule,** a revised bid placed by a buyer to a given seller had to be greater than the buyer's initial bid, while a revised ask submitted by a seller to a given buyer had to be less than the **seller's** initial ask.

Each experiment consisted of several "experimental sessions" in which a particular group of subjects participated. Each experimental session consisted of multiple "trading periods." **A** "tradingperiod" is defined as a period of time in which buyers and sellers had the opportunity to negotiate and conduct a set of trades. **A** buyer earned a profit in each trading period if the revenue it earned in that trading period exceeded its assigned costs. **A seller** earned a profit in each trading period if the revenue it earned

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[25] In this case, the buyer knew with certainty the value the secondary market places on the "carriage right."
[26] In the naturally occurring market. in addition to affiliate fees, cable operators and cable networks negotiate, among other things, over the number of avails which are assigned to the cable operator and the length of the affiliate agreement.
[27] One method of negotiation was simply not to respond to a party's bid or ask until such time as the bid and ask is acceptable.

exceeds its assigned costs.[29] Finally, the experiments varied according to a systematic change in a set of "treatment variables." A 'Treatment variable" is a variable whose value is established by the experimenter and which is critically related to the economic and policy questions under investigation. One important treatment variable is the level of horizontal concentration among the MVPDs.[30] Table 4 shows the number of subscribers and the share of the MVPD market served by each buyer across the different horizontal concentration treatments.

Buyers	MVPD Subscribers (mil.)			Market Share (%)		
	Low/High	High/High	High/Low	Low/High	High/High	High/Low
Cable Op. 1	20	11	32	24.4	13.4	39.0
Cable Op. 2	12	9	36	14.6	11.0	43.9
Cable Op. 3	14	42	*	17.1	51.2	*
Cable Op. 4	22	6	*	26.8	*1.3*	*
DBS Op.	14	14	14	17.1	17.1	17.1

Table **4:** Horizontal Concentration Treatments

The term "Low/High" refers to a low level of horizontal concentration and a high number of buyers. The term "High/High" refers to a high **level** of horizontal concentration and a high number of buyers. And, finally, the term "High/Low" refers to a high level of horizontal concentration and a low number of buyers. **One** objective in selecting the different concentration levels was to obtain data on the outcome of the bargaining game among buyers and sellers across a variety of different environments. Another objective was to obtain bargaining outcome data involving a wide range of different "sized' buyers.

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[28] **Buyers are prevented** from **speaking to sellers, and vice versa. All communications are non-verbal.**
[29] **The prices at which trades occur are not disclosed** to **other participants**
[30] **Another important treatment variable included whether MVPDs are prevented, because** of **channel capacity constraints,** from **conducting trades with each programming network.**

3. Experimental Design

The analysis of how a given level of horizontal concentration among cable operators may affect the flow of programming to viewers requires a carefully constructed "experimental design." An experimental design consists of a set of environments in which the experiments take place. The purpose of the experimental design is to create a *set* of data that shed light on the hypotheses under investigation. Such data are created in part through the specification of a set of "treatment variables." A treatment variable is a characteristic of the environment that is under the control of the experimenter.

3.1 Treatment Variables

A total of **25** experimental sessions were completed involving **200** human subjects.[31] The experimental design consisted of a number of treatment variables leading to what can best be described as a **3** x **3** experimental design. Table 5 depicts the experimental design and the number of sessions (i.e., independent observations) conducted under each treatment condition.

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[31] Due to a software error, in one session involving the limited capacity treatment buyers were able to conduct more than three trades. The results of this session are not reported here.

Table 5: Horizontal Concentration Treatments

(One observation under each of these treatments used a parameter set slightly modified from the one reported here)[33]

Environments	Unlimited	Limited Capacity	
	Capacity	No MFN	MFN
Low Concentration/High Numbers	2	5*	2
High Concentration/High Numbers	2	4	2
High Concentration/Low Numbers		5*	2

The primary treatment variable was the level of horizontal concentration among buyers, where concentration is measured as a percentage of the total MVPD subscribers served by a particular buyer. Because the number of buyers may affect bargaining outcomes, the number of buyers also varied across some of the treatments. The following three treatment conditions were implemented:

- Low Concentration/High Numbers (Low/High). There were five (5) buyers and all served between 14.6% and 26.8% of the MVPD subscriber market.

- High Concentration/High Numbers (High/High). There were five (5) buyers. One buyer served 51.2% of the MVPD subscriber market. All other buyers served between 7.3% and 17.1% MVPD subscriber market.

- High Concentration/Low Numbers (High/Low). There were three (3) buyers. Buyers served 39%, 43.9%, and 17.1% of the MVPD subscriber market.

It is commonly believed that bargaining power increases with the size of the buyer. Based on this, the collective bargaining power of buyers should be the lowest in the Low/High treatment and the highest in the High/Low treatment. In addition, we should observe that large buyers possess greater bargaining power than small buyers. The treatments also permit an evaluation of the conjecture that the size distribution of buyers may affect the flow of programming to viewers. For example, the treatments allow an examination of whether an environment where a single firm that serves 51.2% of the MVPD market is more likely to impede the flow of programming than an environment where the two largest buyers have a MVPD market share of **39.0%** and 43.9%, respectively."

An additional treatment variable examined was the inclusion of a capacity constraint on the buyers. In some of the experimental sessions we did not restrict buyer purchases. Thus, they could trade with all four sellers.[34] In most other experimental sessions, buyers were allowed to conduct a trade with only three sellers. This treatment reflects the fact that most cable operators have diminishing marginal utility (i.e., profitability) from signing additional affiliate agreements with cable networks?' We denote the sessions without the capacity restriction as UNCAP and those with the restriction as *CAP*.

The final treatment variable was the inclusion of a "Most Favored Nation" ("MFN") clause in the *CAP* sessions. In practice, an MFN guarantees that a large cable operator pays an affiliate fee (per subscriber) that is no higher than the affiliate fee paid by a smaller buyer. In the MFN sessions any buyer with a market share greater than **26.8%** was granted a "lowest price guarantee" for all trades she conducted." If, at any time during the trading period. a seller, who had previously conducted a trade with a buyer with MFN status. subsequently traded with another buyer at a lower per subscriber price, then the buyer with the MFN status would be given the lower per subscriber

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[33] **This analysis involves comparing the results obtained in the High/High and High/Low environments.**

[34] **In this case the efficient outcome occurs when buyers trade with all sellers.**

[35] **See Appendix A for a discussion of this effect. One approach to generating this effect is to prevent buyers from completing trades will all sellers. An alternative approach involves providing buyers with a set of valuations for individual sellers as well as valuations for combinations of sellers. Our desire to simplify the analysis required the adoption of the former approach.**

[36] **An M M may be "assigned" to buyers in a more complex manner in the actual market.**

price.[37] **We** attach the term MFN to any experimental session that includes this requirement.

An MFN restriction may have a substantial effect on the affiliate fees cable networks receive from cable operators. Unfortunately, economic intuition provides very little guidance on what that effect may be. On the one hand, an MFN provision may provide cable networks the ability to credibly resist an attempt by a non-MFN endowed cable operator to obtain a lower affiliate fee.[38] If this effect predominates, an MFN may enhance a cable network's profitability. The extent to which it may enhance profitability would depend upon the number of MVPD subscribers that are served by an MVPD service provider that is not MFN-endowed. The greater this number, the greater the percentage of the MVPD marketplace **over** which a programming network can credibly resist a demand for a low affiliate fee. On the other hand, by reducing the range of affiliate fees over which the programming network is willing to trade, an MFN provision may reduce the number of affiliate agreements a cable network completes. The revenue the cable network foregoes due to the reduction in the number of affiliate agreements it completes may be greater than the revenue it obtains from inducing some buyers to pay **a** higher affiliate fee.

3.2   Experiment Institution

Between 7 and 9 subjects participated in each experimental session. The subjects were undergraduates and graduate students from Penn State University. **All** subjects were paid $7 for showing up on time for the session. Subjects were randomly assigned a role of either a buyer or a **seller.** Subjects read instructions prior to each session *(See* Appendix B). They then answered a set of questions designed to test their understanding of the instructions. Once all subjects had successfully answered these questions, a

[37] One difference between the MFN and No **MFN** treatments is that transaction prices in the No MFN treatment were expressed in experimental dollar units, while transaction prices in the MFN treatment were expressed on **a** experimental dollar per subscriber basis. The prices can be compared by dividing the non-M M transaction prices by the number of subscribers served by the particular buyer.

[38] Recently, the YES Network denied Cablevision's demand for a lower affiliate fee based on the notion that a lower fee would trigger **an** MFN provision, All things being equal, the more successful this resistance, the greater the cable operator's incentive to grow. The cable operator's incentive to increase in size is only enhanced by the fan that a large cable operator may be able to impose an MFN provision **on** all the cable networks it carries.

practice trading period was conducted. **A** trading period is simply a period of time within which buyers and **sellers** have the opportunity to conduct a trade. Trades in each trading period were conducted using experimental dollars. which converted at the end of the each experimental session at the rate of .002 experimental dollars to one U.S. dollar. Unlike in the non-practice trading periods, participants could not earn/incur profits/losses during the practice period. Each experimental session was comprised of eight trading periods. The eight trading periods that comprise an experimental session employ the same subjects, parameters, and trading institution. With the exception of the subject's session earnings, all variables of interest are reset at the beginning of a new trading period. Because the participants incurred unavoidable costs in each trading period, we chose to give each participant "working capital" (i.e., an initial endowment of experimental dollars) to defray potential losses. Subjects were informed that they would be asked to leave the experimental session immediately if they incurred losses that exceeded their working capital.[39] Sellers 1 and *2* were endowed with 4,000 experimental dollars in working capital and the rest of the participants were given 2.000 experimental dollars. Sellers 1 and *2* were given more working capital since they were expected to have a more difficult time earning profits than other **sellers.** It is worth noting that Sellers 1 and 2 could make the maximum possible losses in every trading period and still not completely deplete their working capital. This allowed us to observe market negotiations and dynamics even in situations where participants might be incurring significant losses.

The trading institution can best be described as a decentralized bargaining market (DBM). In a DBM, buyers and **sellers** negotiate terms of trade in a pair-wise, private fashion. Participants could only submit a bid to buy or an offer to **sell** to one individual at a time.[40] Each participant was only aware of the bids to buy and offers to sell to which he or she was personally involved.[41] Each buyer (seller) could begin a negotiation with a particular party, decide not to conduct a trade at some point, negotiate with and complete

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[39] **Only in one instance did a participant face this situation. In that case, the seller (Seller 4) noted that he made an error and, since it was clear to all parties that he could easily make up the losses, the subject was allowed to continue.**

[40] **This did not prevent the participant from sending the same bid or ask to multiple entities.**

[41] **There are instances where participants obtained additional market information. In the CAP treatment, a buyer's standing bids would disappear from a seller's screen when the buyer completed three trades. Thus, a seller could potentially see when a buyer had completed three trades. Also. MFN-endowed buyers**